PPC-2115/TPC-2515

User Manual

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NATIONAL INSTRUMENTS™

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ni.com

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Compliance

Electromagnetic Compatibility Information

This hardware has been tested and found to comply with the applicable regulatory requirements and limits for electromagnetic compatibility (EMC) as indicated in the hardware's Declaration of Conformity (DoC)[1]. These requirements and limits are designed to provide reasonable protection against harmful interference when the hardware is operated in the intended electromagnetic environment. In special cases, for example when either highly sensitive or noisy hardware is being used in close proximity, additional mitigation measures may have to be employed to minimize the potential for electromagnetic interference.

While this hardware is compliant with the applicable regulatory EMC requirements, there is no guarantee that interference will not occur in a particular installation. To minimize the potential for the hardware to cause interference to radio and television reception or to experience unacceptable performance degradation, install and use this hardware in strict accordance with the instructions in the hardware documentation and the DoC[1].

If this hardware does cause interference with licensed radio communications services or other nearby electronics, which can be determined by turning the hardware off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the antenna of the receiver (the device suffering interference).
- Relocate the transmitter (the device generating interference) with respect to the receiver.
- Plug the transmitter into a different outlet so that the transmitter and the receiver are on different branch circuits.

Some hardware may require the use of a metal, shielded enclosure (windowless version) to meet the EMC requirements for special EMC environments such as, for marine use or in heavy industrial areas. Refer to the hardware's user documentation and the DoC[1] for product installation requirements.

When the hardware is connected to a test object or to test leads, the system may become more sensitive to disturbances or may cause interference in the local electromagnetic environment.

Operation of this hardware in a residential area is likely to cause harmful interference. Users are required to correct the interference at their own expense or cease operation of the hardware.

Changes or modifications not expressly approved by National Instruments could void the user's right to operate the hardware under the local regulatory rules.

[1] The Declaration of Conformity (DoC) contains important EMC compliance information and instructions for the user or installer. To obtain the DoC for this product, visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

Conventions

The following conventions are used in this manual:

»	The » symbol leads you through nested menu items and dialog box options to a final action. The sequence **File»Page Setup»Options** directs you to pull down the **File** menu, select the **Page Setup** item, and select **Options** from the last dialog box.
	This icon denotes a note, which alerts you to important information.
	This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash. When this symbol is marked on a product, refer to the *Safety* section of Appendix A, *Specifications*, for information about precautions to take.
	When symbol is marked on a product, it denotes a warning advising you to take precautions to avoid electrical shock.
	When symbol is marked on a product, it denotes a component that may be hot. Touching this component may result in bodily injury.
bold	Bold text denotes items that you must select or click in the software, such as menu items and dialog box options. Bold text also denotes parameter names.
italic	Italic text denotes variables, emphasis, a cross-reference, or an introduction to a key concept. Italic text also denotes text that is a placeholder for a word or value that you must supply.
`monospace`	Text in this font denotes text or characters that you should enter from the keyboard, sections of code, programming examples, and syntax examples. This font is also used for the proper names of disk drives, paths, directories, programs, subprograms, subroutines, device names, functions, operations, variables, filenames, and extensions.

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1

General Information

This chapter includes general information about the PPC-2115/TPC-2515 Human Machine Interface (HMI).

Introduction

The PPC-2115/TPC-2515 touch panel computer, a state-of-the-art HMI based on an *x*86 platform, includes these key features:

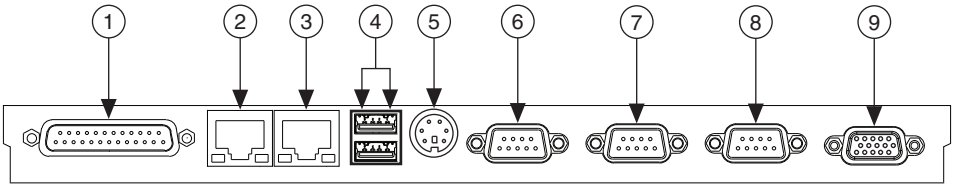
- **Fanless**—Because the system uses a low-power processor, it does not need fans, which often are unreliable and cause dust to circulate inside the equipment.
- **Bright display**—The TFT LCD features a 15 in. display that meets industrial demands for clear interfaces.
- **Powerful communication capability**—The PPC-2115/TPC-2515 is a powerful I/O interface for easy communication with other devices. The I/O interface includes serial ports, an RS485 port, a parallel port, and Ethernet and USB 2.0 support.
- **Windows Operating System**—The PPC-2115 and TPC-2515 support the Windows XP and Windows XP Embedded platforms, respectively.

I/O Ports

The PPC-2115/TPC-2515 includes the following ports:

- One parallel port that supports EPP/ECP/SPP modes
- Three serial ports: RS232 (COM1 and COM3) and RS232/422/485 (COM4)
- Two RJ-45 Ethernet ports: LAN 1 (10/100BaseT) and LAN2 (10/100/1000BaseT)
- One PS/2 port: 6-pin mini-DIN port for keyboard and mouse
- Two USB ports compliant with USB 2.0
- One CompactFlash slot
- One PCMCIA slot
- Three audio ports: one microphone, one line in, and one line out

Figure 1-1 shows the I/O port arrangement.



1	Parallel Port	4	USB	7	COM4 (RS232/422/485)
2	LAN1	5	PS/2	8	COM1 (RS232)
3	LAN2	6	COM3 (RS232)	9	VGA

Figure 1-1. I/O Port Arrangement

For more PPC-2115/TPC-2515 specifications, see Appendix A, *Specifications*.

2

System Setup

This chapter includes setup information for the PPC-2115/TPC-2515.

Important Safety Information

Before setting up the PPC-2115/TPC-2515, read these safety instructions carefully.

Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

Keep this equipment away from humidity.

Place this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.

The openings on the enclosure are for air convection. Protect the equipment from overheating. *Do not cover the openings.*

Make sure the power source voltage is correct before connecting the equipment to the power outlet.

Position the power cord so that people cannot step on it. Do not place anything over the power cord.

All cautions and warnings on the equipment should be noted.

If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

Never pour any liquid into an opening. This may cause fire or electrical shock.

Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.

If one of the following situations arises, have service personnel check the equipment:

- The power cord or plug is damaged.
- Liquid has penetrated into the equipment.
- The equipment has been exposed to moisture.
- The equipment does not work well, or you cannot get it to work according to the user manual.
- The equipment has been dropped and damaged.
- The equipment has obvious signs of breakage.

Do not leave this equipment in an environment where the storage temperature may go below –20 °C (–4 °F) or above 60 °C (140 °F). Doing so could damage the equipment. The equipment should be in a controlled environment.

Caution There is a danger of explosion if the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

Setup

Follow these steps to set up the PPC-2115/TPC-2515:

1. Unpack the PPC-2115/TPC-2515. Be sure your kit includes the following items:
   - The PPC-2115/TPC-2515 HMI
   - Eight panel mounting clamps
   - Eight panel mounting screws
   - One 3-pin power connector and wire
   - One PS/2 splitter cable
   - One HMI Resource CD
   - One CompactFlash to IDE adapter card

   If any items are missing or damaged, contact National Instruments.

Caution Be sure system power is off before plugging in or pulling out the CompactFlash card.

2. Connect the power connector to 24 VDC power lines. Be sure to connect the positive, negative, and ground lines as shown in Figure 2-1. The power lines can be from either a power adapter or in-house power source.

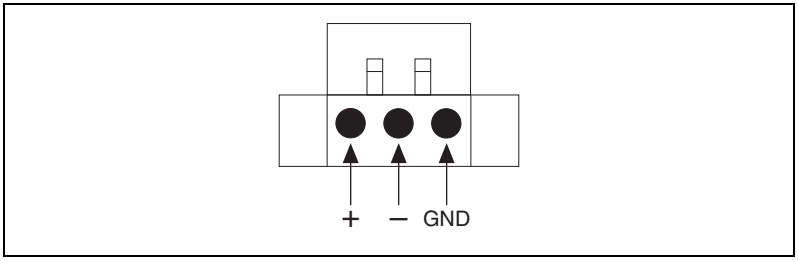


Figure 2-1. Power Connector

3. Connect the power connector to the power receptor on the PPC-2115/TPC-2515. The power receptor pin assignment is shown in Figure 2-2.

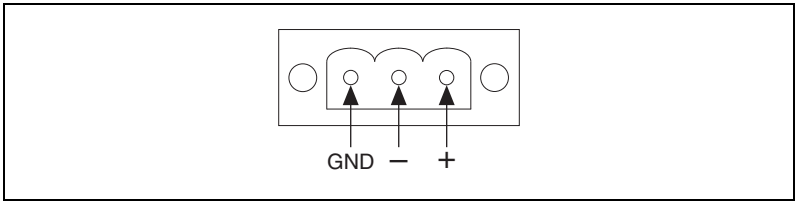


Figure 2-2. Power Receptor and Pin Assignment

4. Press the power button to power on the system.

Touchscreen Calibration

The PPC-2115/TPC-2515 touchscreen should be correctly calibrated and ready to use when you power on the system. However, if the calibration is not correct or you want to choose custom calibration options, refer to Appendix E, *Touchscreen Configuration*.

Dual Display Setting

To use an auxiliary CRT monitor with the PPC-2115/TPC-2515, connect the monitor to the CRT port on the PPC-2115/TPC-2515. Follow these steps to configure the CRT monitor settings:

1. After powering on the system, click the Intel icon in the toolbar on the PPC-2115/TPC-2515 LCD monitor.
2. Select **Graphics Options»Output Device**.
3. The display options window appears, showing the currently active display device. Use this window to select and configure alternate display devices.

Panel Mounting

Follow these steps to mount the PPC-2115/TPC-2515 in a panel:

1. Be sure the adhesive waterproof gasket on the front bezel is in position.
2. Install the PPC-2115/TPC-2515 into the panel opening. (Refer to Appendix A, *Specifications*, for cutout dimensions.)
3. Attach the clamps included in the accessory pack to the holes in the bezel.
4. Insert the screws included in the accessory pack into the clamps. Tighten the screws to fasten the PPC-2115/TPC-2515 against the panel.

Note The mounting panel thickness should be less than 6 mm (0.236 in.).

3

Jumpers and Connectors

This chapter describes the PPC-2115/TPC-2515 jumpers and connectors.

Jumper and Connector Functions

Table 3-1 lists the jumper and connector functions.

Table 3-1. Mainboard Connectors and Jumpers

Label	Function	Description
CN1	VGA	D-Sub 15-pin (female) on panel
CN2	DC in	DC power in connector (5.08 mm, 3-pin housing)
CN3	PCMCIA	One-slot PCMCIA connector
CN4	LCD power	LCD inverter connector
CN5	PS2	Standard mini-DIN 6-pin supports keyboard and mouse
CN7	USB	Two USB type-A female
CN9	IDE	Internal IDE 44-pin (2 mm) connector
CN10	PRT	D-Sub 25-pin (female)
CN11	CF	CompactFlash socket
CN12	Speaker out	Internal speaker connector
CN13	Mic in	Audio mic in
CN14	Line out	Audio line out
CN15	Line in	Audio line in

Table 3-1. Mainboard Connectors and Jumpers (Continued)

Label	Function	Description
CN16 * (JP1)	LVDS LCD	Internal 18-bit LVDS LCD connector
CN17 * (JP3)	Touch	Internal touchscreen connector
COM1	COM1	Serial port: COM1 RS232
COM3	COM3	Serial port: COM3 RS232
COM4	COM4	Serial port: COM4 RS232/422/485
S1	COM4 MODE1	Setting COM4 RS232/422/485 mode
S2	COM4 MODE2	Setting COM4 RS422 master or slave mode
JP4	Clear CMOS	Clear CMOS
SW1	Power switch	System power switch

Jumper and Connector Locations

Figure 3-1 shows the jumper and connector locations.

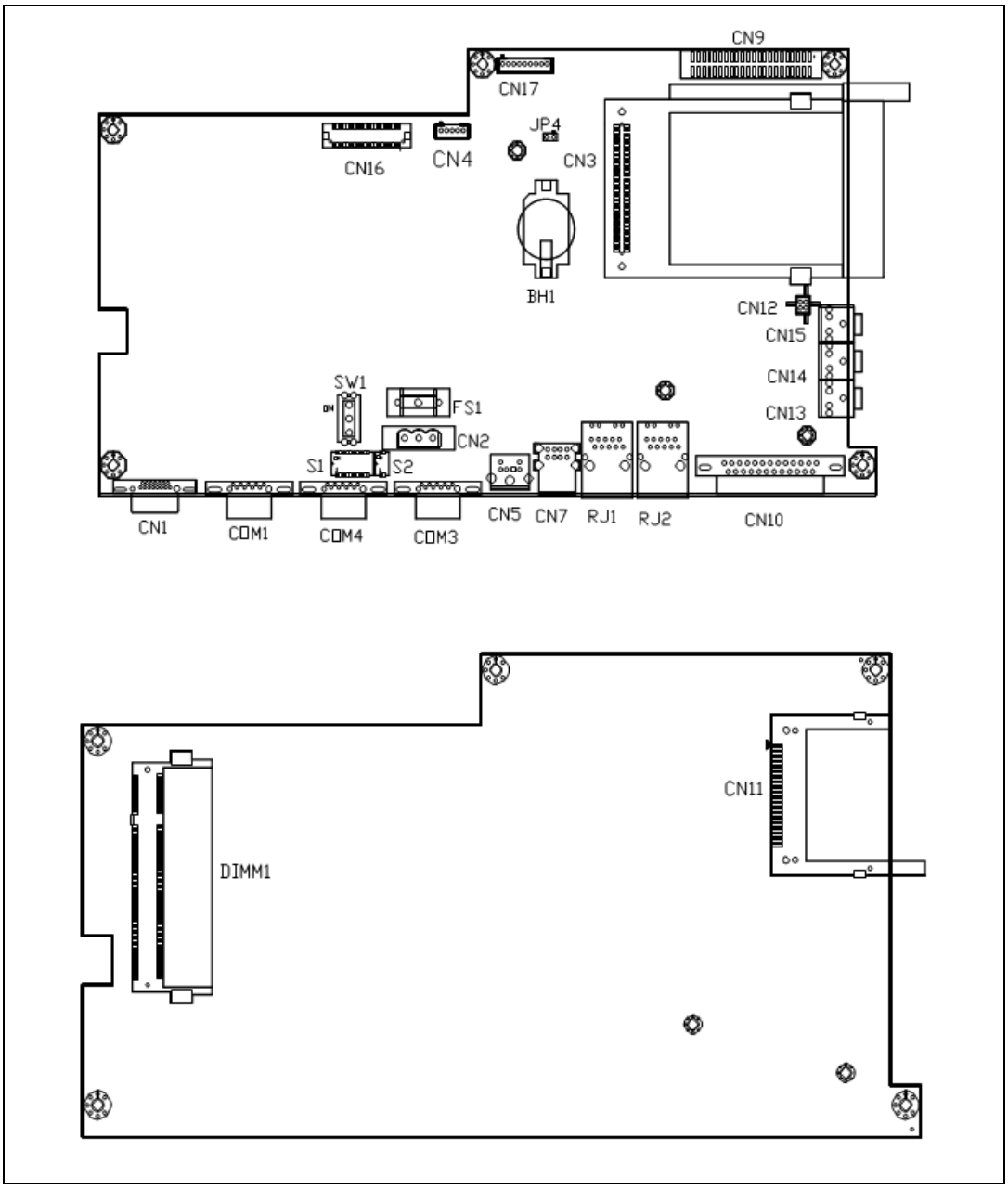


Figure 3-1. Mainboard Jumpers and Connectors

A

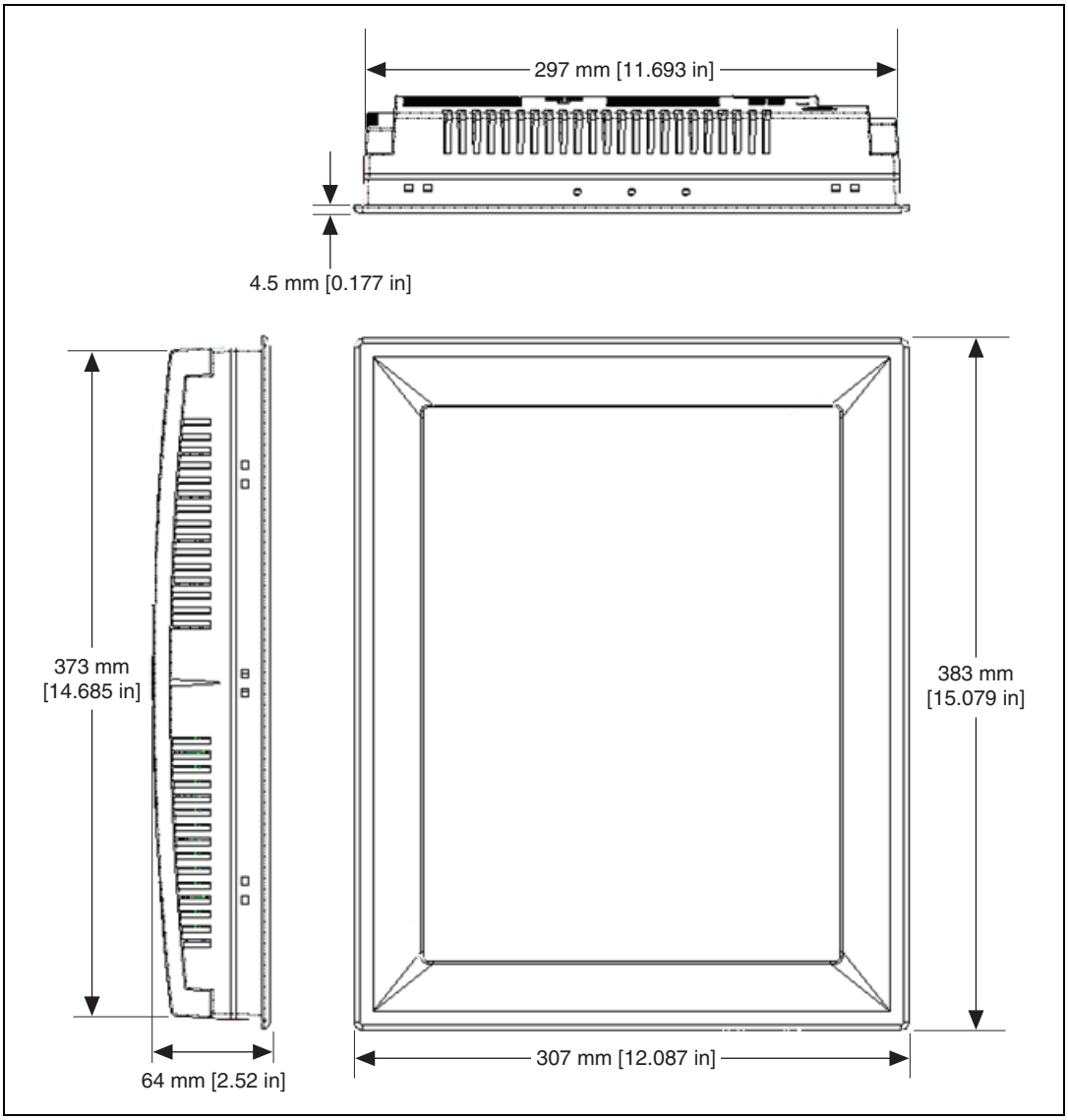
Specifications

Physical

Weight ..... 5.5 kg (without HDD)

Cutout dimensions..... 373.5 × 297.5 mm (suggested)

Dimensions


297 mm [11.693 in]
4.5 mm [0.177 in]
373 mm
[14.685 in]
383 mm
[15.079 in]
307 mm [12.087 in]
64 mm [2.52 in]

System Kernel

CPU	Intel Celeron M (clock rate 600 MHz/1 GHz)
BIOS	Award 4 Mbit flash memory
South bridge	Intel 855GME/852GM GMCH/ICH4 chipset
VGA	Intel 855GME for PPC-2115/TPC-2515-A series; Intel 852GM for PPC-2115/TPC-2515-B series; supports 16 MB frame buffer with system memory; simultaneous support of CRT and LVDS flat panel display
Ethernet	Intel 82562EZ and Intel 82551QM Ethernet controller; IEEE 802.3u protocol compatible
Watchdog timer	W83627 watchdog timer; 1.6 s timeout period
IDE	2 EIDE channels support one IDE compact flash socket onboard and one 44-pin (2 mm) connector

LCD

Display type	TFT color LCD
Size (diagonal)	15 in.
Maximum resolution	1024 × 768 (XGA)
Maximum colors	256,000
Pixel pitch (W × H, mm)	0.3075 × 0.3075
Viewing angle	120
Luminance (cd/m^2)	350

Contrast ratio 500

Operating temperature .....0 to 50 °C (32 to 122 °F) (ambient)

Backlight.....2 CCFL

Backlight life time .....50,000 h

Note There may be several bright or dark pixels on the LCD. This phenomenon is normal in LCD manufacturing.

Touchscreen

Touchscreen type .....Resistive

Base glass construction.....Tempered glass

Resolution.....1024 × 1024

Light transmission .....75% typical

Controller.....RS232 interface

Power rating.....3.3 to 5 V

Durability.....100 million touches

Power

Input voltage .....18 to 32 VDC (the fuse becomes an open circuit if the input level exceeds 33 VDC)

Typical .....24 VDC, 2.0 A

Fuse

Rating.....T3.15 A, 250 V

Size .....5 × 20 mm

Note When replacing the fuse, use only a fuse of the same type and rating.

Note For your protection, the fuse is set to break if the input voltage exceeds 33 VDC.

Environment

Operating temperature	0 to 50 °C (32 to 122 °F)
Storage temperature	–20 to 60 °C (–4 to 140 °F)
Humidity	40 °C @ 10 to 95% relative humidity (noncondensing)
Vibration	1 grms (5 to 500 Hz)
Maximum altitude	2,000 m
Pollution Degree	2

Indoor use only

Safety

This product meets the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 60950-1, EN 60950-1
- UL 60950-1, CSA 60950-1

Note For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326 (IEC 61326): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.

Note For EMC compliance, operate this product according to the documentation.

CE Compliance CE

This product meets the essential requirements of applicable European Directives as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *NI and the Environment* Web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the life cycle, all products must be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit ni.com/environment/weee.

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Mercury Disposal and Recycling

LCD lamp(s) in this monitor contain mercury. Dispose or recycle according to local, state or federal laws. Consult the Electronic Industries Alliance at `www.eiae.org` for more information. For specific information on lamp disposal, consult `www.lamprecycle.org`.

Cleaning

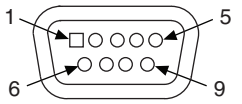
If you need to clean the unit, use a soft, nonmetallic brush. Make sure that the unit is completely dry and free from contaminants before returning it to service.

B

Serial Port Settings

COM1/COM3 Connector Pinout

The following figure and table show the COM1/COM3 connector pinout.

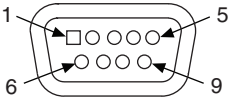


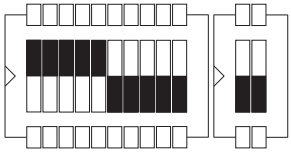
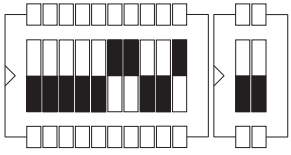
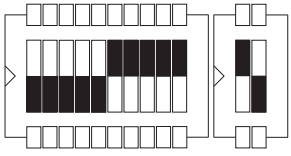
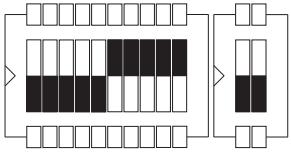
Pin	Signal
1	NDCD
2	NRX
3	NTX
4	NDTR
5	GND
6	NDSR
7	NRTS
8	NCTS
9	NRI

COM4 Connector Pinout and Settings

The PPC-2115/TPC-2515 COM4 serial port is adjustable. You can set it to RS-232, RS-422, or RS-485, and it has auto data flow control capability. In other words, the PPC-2115/TPC-2515 can automatically detect the data flow direction at this port when two-wired RS-485 communication is activated.

The following figure and table show the COM4 pinout and settings.



COM4 Mode	S1 and S2 Setting
RS232 Mode	
RS485 Mode	
RS422 Master Mode	
RS422 Slave Mode	

PIN	RS-232	RS-422	RS-485
1	NDCD	TX–	D–
2	NRX	TX+	D+
3	NTX	RX+	—
4	NDTR	RX–	—
5	GND	GND	GND
6	NDSR	—	—
7	NRTS	—	—
8	NCTS	—	—
9	NRI	—	—

C

Watchdog Timer Programming

Overview

You can use the PPC-2115/TPC-2515 watchdog timer to monitor system software operation and take corrective action if the software fails to function after the programmed period. This appendix describes how to program the watchdog timer operation.

The watchdog timer is built into the W83627HF I/O controller. It includes the following programmable functions:

- You can enable and disable the timer via programming.
- You can set the timer interval from 1 to 255 seconds or 1 to 255 minutes.
- The timer generates an interrupt or resets the signal if the software fails to reset the timer after a timeout.

Watchdog Timer Programming

The watchdog timer I/O port address is 2E (hex) (the address port) and 2F (hex) (the data port). You must first assign the register address by writing the address value to address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

Figure C-1 describes the watchdog timer programming procedure, and Table C-1 describes the watchdog timer registers.

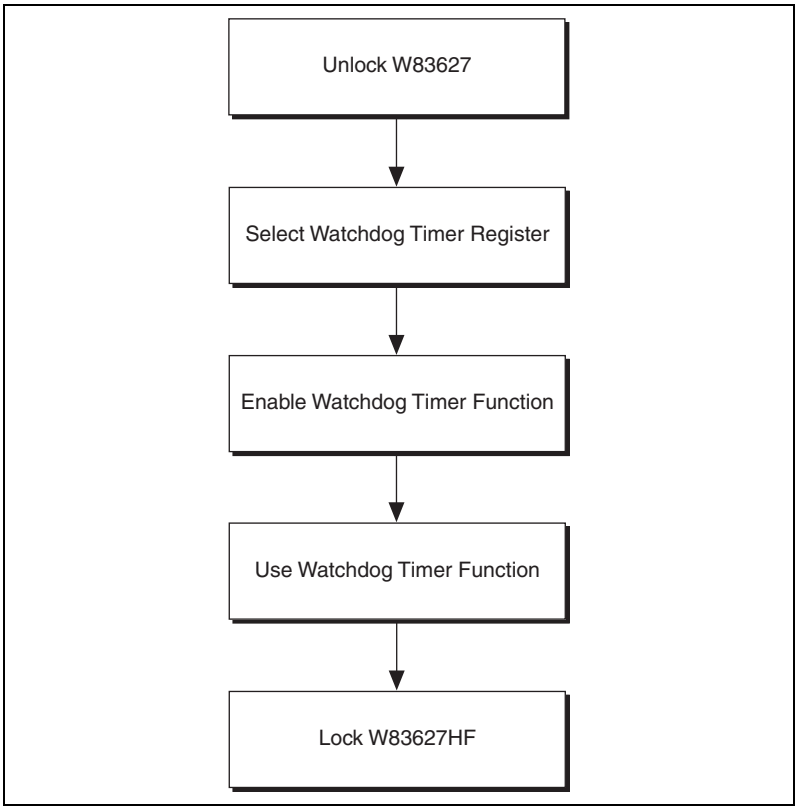


Figure C-1. Watchdog Timer Programming Procedure

Table C-1. Watchdog Timer Registers

Address of Register (2E)	Attribute	Description
Read/Write	Value (2F) and description	—
87 (hex)	—	Write this address twice to I/O address port 2E (hex) to unlock the W83627HF.
07 (hex)	Write	Write 08 (hex) to select the watchdog timer register.
30 (hex)	Write	Write 01 (hex) to enable the watchdog timer function. The default is disabled.
F5 (hex)	Write	Set seconds or minutes as the timer unit. Write 0 to bit 3 (default): second. Write 1 to bit 3: minute.
F6 (hex)	Write	0: Stop timer 01 to FF (hex) (default): The count amount, in seconds or minutes, depends on the value set in register F5 (hex). This number determines how long the watchdog timer waits for the strobe before generating an interrupt or reset signal. Writing a new value to this register resets the timer to count with the new value.
F7 (hex)	Read/Write	Bit 6: Write 1 to enable the keyboard to reset the timer. Write 0 to disable. Bit 5 (default): Write 1 to generate a timeout signal immediately and automatically return to 0. Bit 4 (default = 0): Read the watchdog timer status. 1 means the timer is timeout.
AA (hex)	—	Write this address to I/O port 2E (hex) to lock the watchdog timer.

Example Programs

Example 1: Enable the Watchdog Timer and Set 10 s as the Timeout Interval

```
;------------------------------------------------------------
Mov dx,2eh ; Unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;------------------------------------------------------------
Dec dx ; Set second as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al
;------------------------------------------------------------
Dec dx ; Set timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10
Out dx,al
;------------------------------------------------------------
Dec dx ; lock W83627HF
Mov al,0aah
Out dx,al
```

Example 2: Enable the Watchdog Timer and Set 5 Min as the Timeout Interval

```
;--------------------------------------------------------
Mov dx,2eh ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx ; Set minute as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
Or al,08h
Out dx,al
;--------------------------------------------------------
Dec dx ; Set timeout interval as 5 minutes and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,5
Out dx,al
;--------------------------------------------------------
Dec dx ; lock W83627HF
Mov al,0aah
Out dx,al
```

Example 3: Enable the Mouse to Reset the Watchdog Timer

```
;------------------------------------------------------------
Mov dx,2eh ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
;------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;------------------------------------------------------------
Dec dx ; Enable watchdog timer to be reset by mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;------------------------------------------------------------
Dec dx ; lock W83627HF
Mov al,0aah
Out dx,al
```

Example 4: Enable the Keyboard to Reset the Watchdog Timer

```
;------------------------------------------------------------
Mov dx,2eh ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
;------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;------------------------------------------------------------
Dec dx ; Enable watchdog timer to be strobed reset by keyboard
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,40h
Out dx,al
;------------------------------------------------------------
Dec dx ; lock W83627HF
Mov al,0aah
Out dx,al
```

Example 5: Generate a Timeout Signal without Timer Counting

```
;------------------------------------------------------------
Mov dx,2eh ; unlock W83627H
Mov al,87h
Out dx,al
Out dx,al
;------------------------------------------------------------
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------------
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;------------------------------------------------------------
Dec dx ; Generate a time-out signal
Mov al,0f7h
Out dx,al ;Write 1 to bit 5 of F7 register
Inc dx
In al,dx
Or al,20h
Out dx,al
;------------------------------------------------------------
Dec dx ; lock W83627HF
Mov al,0aah
Out dx,al
```

D

Accessory Kit Assembly Procedure

This appendix explains how to connect to a CD-ROM via the CompactFlash slot.

CompactFlash to IDE Transfer Kit Assembly

Follow these steps to connect to a CD-ROM via the CompactFlash slot:

1. Connect the IDE cable to the adapter board.
2. Insert the adapter board into the CompactFlash slot.
3. Connect the CD-ROM to the IDE cable.
4. Connect the external power line to the CD-ROM.

E

Touchscreen Configuration

This appendix explains how to configure the PPC-2115/TPC-2515 touchscreen using the PenMount Control Panel.

Touchscreen Calibration

Click the **pm** icon in the lower right corner of the screen to access the PenMount Control Panel. The panel contains five functions: Calibrate, Draw, and Option, all described below, Multiple Monitors, and About. Multiple Monitors is for calibrating multiple touchscreen displays only; it does not apply to the PPC-2115/TPC-2515, which allows only one touchscreen display. About shows the driver version.

Calibrate

There are two ways to calibrate the touchscreen—standard calibration and advanced calibration.

Use standard calibration to adjust newer touchscreens, which need only a few calibration points. Follow these steps to use standard calibration:

1. Click the **Standard Calibration** button on the **Calibrate** tab of the PenMount Control Panel.
2. A screen with a small red square appears. Touch the red square on this screen and the screens that follow it.
3. The calibration is complete after you touch the red square on the fifth screen.

Note Press <ESC> to skip any calibration screen.

Use advanced calibration for older touchscreens, which may need additional calibration. Advanced calibration uses 4, 9, 16, or 25 calibration points. Follow these steps to use advanced calibration:

1. On the **Calibrate** tab of the PenMount Control Panel, set the number of calibration points in the **Advanced Mode** drop-down menu.
2. Select **Plot calibration data** if desired. If you enable **Plot calibration data**, blue lines show linearity before calibration, and black lines show linearity after calibration.
3. Click the **Advanced Calibration** button.
4. A screen with a small red square appears. Touch the red square on this screen and the screens that follow it.
5. The calibration is complete after you touch the red square on the last screen.

Draw

The draw option tests touchscreen operation by showing touch location. Follow these steps to use the draw function:

1. Click the **Draw** button in the **Draw** tab of the PenMount Control Panel.
2. Touch several points on the screen. The screen should show the points you touched.
3. Click **Menu**»**Clear Screen** to clear the drawing.

Option

Use the controls in the **Option** tab to set the operation mode and beep sound. In **Stream Mode**, the mouse functions normally. In **Point Mode**, the mouse has only a click function; onscreen dragging is disabled. Select **Enable Beep Sound** to turn on the beep sound. Adjust the beep frequency and duration using **Beep Frequency** and **Beep Duration**. Click **Back to Default** to restore the defaults.

F

Fuse Replacement

Caution Do *not* replace the fuse unless it is damaged. Do *not* replace the fuse with a differently rated fuse. For more information, see the fuse specifications in Appendix A, *Specifications*.

Follow these steps to replace the fuse:

1. Remove the fuse cover.
2. Replace the damaged fuse with a new one.
3. Place the fuse cover back into position.

G

Features in Windows XP Embedded (TPC-2515)

The TPC-2515 supports the Windows XP Embedded platform (commonly abbreviated XPe), which is a componentized version of the Windows XP Professional edition. This appendix explains the version information and the EWF utility for Windows XP Embedded.

Version Information

You can access the version information by selecting **Start»All Programs» Utilities**.

The version information states the current XPe runtime information including hardware platform, version, build number, release date, XPe QFEs installed in the component database, and Windows XP Pro patches installed.

EWF

Enhanced Write Filter (EWF) provides an upper filter in the storage device driver stack that redirects disk write operations to volatile (RAM) or nonvolatile (disk) storage. EWF protects a volume from write access and offers the following benefits:

- Write-protects one or more partitions on your system.
- Enables read-only media, such as CD-ROM or flash, to boot and run.
- Prolongs the life span of write-sensitive storage, such as CompactFlash.

To disable/enable EWF, go to **Start»All Programs»Utilities** and select the **EWF** tab. The default setting is disabled.

When EWF is enabled, the `C:` partition is protected from any disk writing. In this mode, any changes on the `C:` partition (including modifications to files or the registry) are redirected to memory. Thus, these changes are discarded in the next system startup. You can manually enable this mode after finishing all system changes such as installing your applications or adjusting system settings.

Login

By default, XPe automatically logs into the Administrator account. The default password is *password*, all lower case, with no quotes.

The Administrator account defaults are:

- **Login**: Administrator
- **Password**: password

H

Technical Support and Professional Services

Visit the following sections of the award-winning National Instruments Web site at ni.com for technical support and professional services:

- **Support**—Technical support at ni.com/support includes the following resources:
  - **Self-Help Technical Resources**—For answers and solutions, visit ni.com/support for software drivers and updates, a searchable KnowledgeBase, product manuals, step-by-step troubleshooting wizards, thousands of example programs, tutorials, application notes, instrument drivers, and so on. Registered users also receive access to the NI Discussion Forums at ni.com/forums. NI Applications Engineers make sure every question submitted online receives an answer.
  - **Standard Service Program Membership**—This program entitles members to direct access to NI Applications Engineers via phone and email for one-to-one technical support as well as exclusive access to on demand training modules via the Services Resource Center. NI offers complementary membership for a full year after purchase, after which you may renew to continue your benefits.

    For information about other technical support options in your area, visit ni.com/services, or contact your local office at ni.com/contact.
- **Training and Certification**—Visit ni.com/training for self-paced training, eLearning virtual classrooms, interactive CDs, and Certification program information. You also can register for instructor-led, hands-on courses at locations around the world.
- **System Integration**—If you have time constraints, limited in-house technical resources, or other project challenges, National Instruments Alliance Partner members can help. To learn more, call your local NI office or visit ni.com/alliance.

If you searched ni.com and could not find the answers you need, contact your local office or NI corporate headquarters. Phone numbers for our worldwide offices are listed at the front of this manual. You also can visit the Worldwide Offices section of ni.com/niglobal to access the branch office Web sites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.

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